

HAPPY ISLES BRIDGE

HAER NO. CA-97

Yosemite National Park Roads and Bridges

Spanning Merced River on service road

Yosemite National Park

Mariposa County

California

HAER

CAL

22-YOSEM,

18-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD

National Park Service

U.S. Department of the Interior

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HAPPY ISLES BRIDGE  
Yosemite National Park  
HAER No. CA-97

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I. INTRODUCTION

Location:

Happy Isles Bridge carries a park road across the Merced River at Happy Isles at the east end of the Yosemite Valley in Yosemite National Park, Mariposa County, California.

QUAD: HALF DOME, CA  
UTM: 11/274670/4179020

Date of Construction:

1929

Designer and Builder:

Designed by the San Francisco office of the Bureau of Public Roads, with design assistance from the National Park Service Landscape Architecture Division.

Contractors: Schuler and McDonald

Original and Present Owner

Yosemite National Park, National Park Service.

Structure Type:

Stone-faced reinforced concrete filled spandrel arch bridge

FHWA Structure No.:

8800-009P

Present Use:

Park road bridge.

Significance:

The Happy Isles Bridge exemplifies the National Park Service "rustic style" of architecture.

Project Information:

Documentation of Happy Isles Bridge is part of the Yosemite National Park Roads and Bridges Recording Project, conducted by the Historic American Engineering Record in summer 1991.

Richard H. Quin, Historian

## II. HISTORY

This is one in a series of reports prepared for the Yosemite National Park Roads and Bridges Recording Project. HAER No. CA-117, YOSEMITE NATIONAL PARK ROADS AND BRIDGES, contains an overview history of the park roads.

### HISTORY OF HAPPY ISLES BRIDGE

Although the National Park Service constructed the Happy Isles Bridge [HAER No. CA-104] over the Merced River at the upper end of Yosemite Valley in 1921, the bridge had only been in use for seven years before the agency determined that it was inadequate for traffic loads. Accordingly, the Bureau of Public Roads (BPR), which assumed responsibility for new road construction in all the national parks in 1925, drew up plans for a new bridge at their San Francisco district office in 1928. The BPR chose a site 500 yards downstream from the old bridge for a new stone-faced reinforced concrete filled spandrel arch bridge. Test pits for the structure were dug in March 1928, and the data was transmitted to the BPR's district office.<sup>1</sup>

Bids for the construction of the bridge were opened at the Bureau's San Francisco office on 12 July 1928. Schuler & McDonald, an Oakland, California construction firm, submitted the low bid of \$34,999 and the Department of the Interior awarded the firm the contract on 23 July. The firm was allotted 135 days to complete the project.<sup>2</sup>

Schuler & McDonald established their construction camp near the base of Bridalveil Fall, using a site that had been used by several other bridge and tunnel contractors, and lately used by the firm of Rocca & Caletti, which had just completed the construction of five other Valley bridges. The bridge site having already been cleared by National Park Service crews, construction began on 13 August 1932.<sup>3</sup>

Work began with excavation of the east abutment, using a tractor hoist fitted with a derrick and dump buckets. Schuler & McDonald purchased a used cement mixer that Rocca & Caletti had used on their projects, despite the misgivings of the supervising engineer that the machine was badly worn and potentially unreliable. Schuler & McDonald engaged stonecutters who had worked for Rocca & Caletti to prepare the stone for the bridge, having no experienced masons of their own. The cutting of stone for the bridge began on 17 September; the granite stone was obtained from a boulder at the base of Rocky Point, a talus cone at the foot of the Lower Brother (smallest of the Three Brothers, a prominent Yosemite Valley landmark). The arch ring stones or voussoirs were cut using wooden templates. While this work was going on, the excavation for the west abutment was finished and the wooden falsework for the arch centering was erected. In addition to the stone taken from the boulder at Rocky Point, the project utilized crushed rock aggregate obtained from the crusher plant located below Pohono Bridge, and sand from a pit in Wildcat Creek. The steel reinforcing bars were obtained from the Soule Steel Company of San Francisco.<sup>4</sup>

The arch ring stones were set in place using a old traveling crane, also purchased from Rocca & Caletti. This venerable device utilized a wooden Howe truss and did its job well. The concrete was then poured for the arch rings, followed by the spandrels, with the concrete for the crown or key being poured last. The steel reinforcing rods or rebar were doweled out from the abutments. The placing of weathered stone for the head walls followed.<sup>5</sup> The acting park superintendent noted in his monthly report that the work was behind schedule because the contractor was evidently unfamiliar with this sort of work.<sup>6</sup>

On 1 October, Schuler & McDonald was notified that park funds for the construction of the bridge were exhausted, and that work should stop unless the contractor was willing to finance the ongoing work out of pocket. The contractor decided to continue work for a while, as the pouring of the concrete was well underway and a disruption would cause considerable problems when work resumed. When pouring for the major part of the bridge was completed, the contractor asked for the proffered shutdown on 7 November, and was approved.<sup>7</sup>

Work on the bridge resumed on 15 April 1929 with excavation for the east subway or equestrian tunnel. Footings for the wing walls were excavated, the struts poured, and arch stones set for the east subway. The spandrel wall was then constructed, the stones being placed by the traveler crane. All rock was placed by the end of June. A membrane waterproofing was then applied to the concrete surfaces. The bridge was filled with in part with material taken out in the excavation. Another delay occurred at this point, when some of the crushed rock for the fill was rejected by the engineer. By the end of July, 157 percent of the allotted time had elapsed, and the bridge was still not ready. By late summer the backfill had been placed and the bridge was subsequently paved. The structure was completed and accepted by the Park Service on 16 August 1929. Although the engineers were pleased with the new bridge, they noted that the contractor lost \$9,332.31 on the project; reasons given were the entering of too low a bid for the work, the employment of too small a force to meet the deadline, and the use of worn equipment that was in some cases far too light for the project.<sup>8</sup> Total cost of the structure was \$41,673.03.<sup>9</sup>

Happy Isles Road was graded and paved in an accompanying project. Shoulders were widened and stone was set between the road and the bordering sidewalk. The curb stone was quarried at Arch Rock.<sup>10</sup> Workers from the Emergency Conservation Works, a federal relief program, landscaped the approaches to the bridge in 1934.<sup>11</sup>

The Happy Isles Bridge is 170' long, and constructed on a 20 percent skew from the centerline. The bridge is 40' wide, with a clear roadway of 27' and 5' sidewalks on either side. The single span across the river measures 75'. Each of the abutments features a semi-circular arched equestrian tunnel 9' 8" high; the west tunnel is 8' 9" in width, and the east one 9' 3"; these subways are similar to the ones on Clark's Bridge, which was constructed at about the same time. The equestrian tunnels were designed to accomodate a bridle path that was built through the east end of the Valley at about the same time as the bridges.

Stonework on the bridge differs from that on the other stone-faced bridges in the Valley, in that it used freshly-quarried stone, bedded in mortar with raked joints. This angular, rough-cut stone was laid in a random, almost haphazard pattern, contrasting sharply with the larger coursed blocks employed four years later in the construction of the Stoneman Bridge. The Happy Isles Bridge is very similar to the Clarks Bridge [HAER No. CA-96] three-quarters of a mile downstream, which was built within the year.

NOTE: Some thirty of forty yards west of the bridge, the Happy Isles Road crosses a stone arched culvert over an intermittent branch. The barrel vault and arch for the culvert is of similar construction to the equestrian subways on the bridge, but the embankment walls flanking the culvert are faced with cut river rubble stone. This culvert was built in May 1929.<sup>12</sup>

III. ENDNOTES

1. H. S. Tolen and A. W. Schimberg, Final Construction Report, Yosemite National Park Project 1-B2, Happy Isles Bridge, June 1930, 1; E. P. Leavitt, Acting Superintendent's Monthly Report, March 1928, 5.
2. Tolen and Schimberg, 2.
3. *Ibid.*, 3.
4. *Ibid.*, 3-4.
5. *Ibid.*, 4-5.
6. Leavitt, Superintendent's Monthly Report, September 1928, 3.
7. Tolen and Schimberg, 5.
8. *Ibid.*, 5-6, 9; Charles Goff Thomson, Superintendent's Monthly Report, May 1929, 15; Superintendent's Monthly Report, June 1929, 9; Superintendent's Monthly Report, July 1929, 7.
9. National Register of Historic Places nomination for the Yosemite Valley Bridges, prepared by Merrill Ann Wilson, August 1976, Sec. 7, p. 3.
10. Arthur E. Cowell, Associate Engineer, Bureau of Public Roads, "Report of Construction Activities, 1929," Typed MSS, 21 February 1930, 4-5, 9. Yosemite National Park Maintenance and Engineering Office. The quarry at the Arch Rock Entrance Station (on the north side of the All-Year Highway) is still visible.
11. Thomson, Superintendent's Monthly Report, February 1934, 10.
12. *Idem*, Superintendent's Monthly Report, May 1929, 8.

#### IV. BIBLIOGRAPHY

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Moss, Lonnie E. Bridge Safety Inspection Report, Happy Isles Bridge, Yosemite National Park. (Denver, CO: Federal Highway Administration, 27 January 1977).

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